

SAFETY DATA SHEET

According to Regulation (US HCS) 29 CFR 1910.1200

Created on: 04/30/2024
Replaces SDS: 12/11/2023
Version: 1.1

Copper Alloy Powder / Cu Alloy Powder



SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Trade name: **Copper Alloy Powder / Cu Alloy Powder**

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: Metal powder for use in additive layer manufacturing.

Uses advised against: All other uses are strongly discouraged.

Details of the supplier of the safety data sheet

Supplier

Responsible Person:	Mike Casella
Phone:	+1 (630) 215-5689
E-Mail:	mike.casella@kmeamerica.com

Emergency telephone number

Giftinformationszentrum Nord, GIZ-Nord

Tel: +4955119240 (24/7, service provided in English)

SECTION 2: Hazards identification

Classification of the substance or mixture

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

GHS – Classification

Hazardous to the aquatic environment — Chronic hazard category 2

Hazard Statements:

Toxic to aquatic life with long lasting effects

Label elements

Signal word: -

Pictogram: **GHS09**



Hazard Statements:

Toxic to aquatic life with long lasting effects

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Precautionary Statements:

Avoid release to the environment.

Collect spillage.

Dispose of contents/container to waste disposal in accordance with local/regional/national regulations.

Hazard determining component:

Copper.

Other hazards

Copper and silver are suspected to have endocrine disrupting properties.

SECTION 3: Composition/information on ingredients

Mixture

Chemical name	CAS No	Concentration	Classification	H-phrases
Copper	7440-50-8	≤ 99 %	Aquatic Chronic 2	H411
Silver	7440-22-4	≤ 0,2 %	-	-
Phosphorous	7723-14-0	≤ 0,2 %	Flam. Sol. 1 Aquatic Chronic 3	H228 H412

Full text of H-phrases: see Section 16.

Further information

Copper and silver are suspected to have endocrine disrupting properties.

SECTION 4: First aid measures

Description of first aid measures

General information

First responders: Ensure self-protection. IF exposed or if affected: Seek medical advice/call for medical assistance. Remove affected person from danger area and lie down.

After inhalation

IF INHALED: Remove person to fresh air and ensure unobstructed breathing. Seek medical attention if symptoms occur.

After skin contact

IF ON SKIN: Wash immediately with plenty of water and mild soap. If skin irritation occurs: Seek medical advice/attention.

After eye contact

IF IN EYES: Rinse cautiously with water for several minutes. Remove any contact lenses if possible. Continue to rinse. Consult a doctor.

After ingestion

DO NOT induce vomiting. Rinse out mouth. Never administer anything by mouth to an unconscious

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person. Seek medical advice/medical assistance.

Most important symptoms and effects, both acute and delayed

Dust may irritate the eyes and respiratory tract.

Indication of any immediate medical attention and special treatment needed

Symptomatic treatment.

SECTION 5: Firefighting measures

Extinguishing media

Copper alloys in their bulk state are normally non-combustible, but fine powders or dusts of the material can pose an additional risk in the event of a fire. Adapt fire-fighting measures to the particular situation.

Suitable extinguishing media

Metal fire extinguishing powder, dry sand, sodium chloride.

Extinguishing media which must not be used for safety reasons

Water, CO₂

Special hazards arising from the substance or mixture

In the event of fire, copper alloys above 400 ° C can form toxic metal oxides that pose a major inhalation hazard.

Advice for firefighters

Adapt fire-fighting measures to the environment. Do not take any measures that involve personal risk or have not been adequately trained. If it is safe to do so, remove the container from the danger zone. Wear self-contained breathing apparatus (SCBA) with full face shield operating in positive pressure mode. Wear appropriate protective clothing/apparel that covers the entire body.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear protective gloves/protective clothing/eye protection/face protection. Remove contaminated clothing and wash before reuse. Ensure good ventilation. Avoid dust formation. Evacuate non-involved personnel from the area.

Environmental precautions

Avoid release into the environment. Do not allow to enter waters or drains. In case of uncontrolled release of larger quantities of the material into the environment, inform competent authorities and initiate appropriate environmental protection measures.

Methods and material for containment and cleaning up

Contain spillage. Pick up spilled material mechanically and place in a suitable waste container. Use vacuum suction with HEPA filters to clean up spilled material suppressing generation of airborne

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dust.

Reference to other sections

For information on safe handling see section 7.
For information on personal protection see section 8.
For information on disposal see section 13.

SECTION 7: Handling and storage

Precautions for safe handling

Advice on safe handling

Do not eat, drink, smoke or sniff when handling the product. Prevent contact with skin, eyes and clothing. Observe general workplace hygiene. Wash hands with soap and water before breaks, at the end of work and immediately after handling. Remove contaminated clothing and shoes immediately and do not wear outside of work area. Check gloves regularly for wear, leaks and contamination and replace accordingly. Keep away from food, feed and drink. Never store in containers that are used for, or can be mistaken for, food or beverage containers. Thoroughly clean work areas on a regular basis. Wear protective gloves/protective clothing/eye protection/face protection (see section 8.2). Remove contaminated clothing and wash before reuse.

Advice on fire and explosion protection

Avoid accumulation and swirling up of dust. Collect dust mechanically (e.g. with industrial vacuum cleaner).

Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and containers

Store only in the original container. Store container in a well-ventilated and dark place. Keep container tightly closed. Store in places without fire hazard, away from sources of sparks, ignition and heat. Protect from direct sunlight. Store under lock and key. Keep away from flammable materials. Keep away from food, beverages and animal feed. Observe and comply with all relevant local and national regulations concerning storage of containers.

Advice on combined storage

Keep separate from oxidizing agents.

Further information on storage conditions

Store in a dry place.

Specific end use(s)

Metal powder for use in additive layer manufacturing.

SECTION 8: Exposure controls/personal protection

Control parameters

Substance	CAS No.	Regulatory Limits		Recommended Limits	
		OSHA PEL	Cal/OSHA	NIOSH REL	ACGIH® TLV

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				PEL		
		ppm	mg/m ³	8-hour TWA (ST) STEL (C) Ceiling	Up to 10-hour TWA (ST) STEL (C) Ceiling	
Copper Fume (as Cu)	7440-50-8		0.1	0.1 mg/m ³	0.1 mg/m ³	See table below
Copper Dusts and mists (as Cu)	7440-50-8		1	1 mg/m ³	1 mg/m ³	See table below
Silver, metal and soluble compounds (as Ag)	7440-22-4		0.01	0.01 mg/m ³	0.01 mg/m ³	See table below

Substance	ACGIH® TLV
Copper	TLV-TWA, 0.2 mg/m ³ - fume, as Cu TLV-TWA, 1 mg/m ³ - dusts and mists, as Cu
Silver and compounds	TLV-TWA, 0.1 mg/m ³ - metal dust and fume 0.01 mg/m ³ - soluble compounds, as Ag

Exposure controls

Protective and hygiene measures

General precautions to be observed when handling the product. Avoid contact with eyes. Avoid contact with skin. Wash hands before breaks and at the end of work. Avoid dust formation. Technical protective measures always take precedence over all other personal protective measures. The use of mechanical equipment such as mechanical extraction methods always take precedence over manual work.

Respiratory protection

In case of dust formation: Wear respiratory protection against dust particles. Observe wearing time and manufacturer's instructions for use. Recommended respiratory protection: Half/quarter masks with particle filter P3, identification color: white.

Hand protection

Use gloves made of nitrile rubber, butyl rubber or PVC. The glove material must be impermeable and resistant to the substance. The selection of a suitable glove depends not only on the material, but also on other quality characteristics and varies from manufacturer to manufacturer. When selecting gloves, mechanical risks and cut hazards must also be taken into account.

Eye protection

Select safety goggles with side shields or full safety goggles in accordance with guideline EN 166 - Personal eye protection. In case of high risk, wear additional face shield.

Further skin protection

Wear suitable long-sleeved protective clothing when working. Full protective suit, if necessary. Body

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protective equipment must be selected in its design depending on the concentration and quantity of hazardous substances specific to the workplace. The personal protective equipment used must comply with the requirements of Regulation (EU) 2016/425 and amendments (CE marking).

Environmental exposure controls

Observe national emission regulations. Prevent product from entering drains, watercourses and soil.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance:	
Color	Copper-red
Aggregate state	Solid
Particle Properties:	Particle size 5 - 200 µm
Odor:	odorless
odor threshold:	Not applicable.
pH:	Not applicable.
Melting point/freezing point:	1075 °C to 1085 °C
Initial boiling point and boiling range:	Not determined.
Flashpoint:	Not applicable.
Evaporation rate:	Not applicable.
Flammability (solid, gaseous):	The material in solid form not flammable. Fine powders can be flammable.
Upper/Lower flammability and explosion limits:	Material not flammable or explosive in solid form.
Vapor pressure:	Not applicable.
Vapor density:	Not applicable.
Relative density:	No data available.
Density:	approx. 8.9 g/cm ³ as solid metal, approx. 4.9 g/cm ³ as alloy powder
Solubility (in water):	Not applicable.
Partition coefficient: n-octanol / water:	No data available.
Auto ignition temperature: Solid:	Not applicable.
Decomposition temperature:	Not applicable.
Viscosity:	Not applicable.
Explosive Properties:	Non-explosive in solid form.
Oxidizing Properties:	No oxidizing properties.

Other information

No further information available.

SECTION 10: Stability and reactivity

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Reactivity

The alloys have no known reactivity in their solid form when used under intended conditions.

Chemical stability

The product is stable when used as intended.

Possibility of hazardous reactions

Contact with incompatible materials will result in a corrosion reaction.

Conditions to avoid

Sources of ignition, open light. Avoid contact with incompatible materials. Metal oxides may form in extreme heat.

Incompatible materials

Strong oxidizing agents, acids, bases, halogens, mercury, ammonia, acetylene.

Hazardous decomposition products

Various hazardous decomposition products may be formed upon contact with incompatible materials. In case of fire, formation of toxic metal oxides possible.

SECTION 11: Toxicological information

Information on the likely routes of exposure

Acute toxicity

Acute Toxicity Oral:

Red Phosphorous	LD50 oral Rat Value: > 15000 mg/kg
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Skin corrosion / irritation

Based on the available data, the classification criteria are not met.

Serious eye damage / irritation

Based on the available data, the classification criteria are not met.

Sensitization of respiratory tract / skin

Based on the available data, the classification criteria are not met.

Germ cell mutagenicity

Based on the available data, the classification criteria are not met.

Carcinogenicity

Based on the available data, the classification criteria are not met.

Reproductive toxicity

Based on the available data, the classification criteria are not met.

Specific target organ toxicity single exposure

Dust may irritate the eyes and respiratory tract.

Specific target organ toxicity repeated exposure

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Based on the available data, the classification criteria are not met.

Aspiration risk

Based on the available data, the classification criteria are not met.

Other information

Copper and silver are suspected of having endocrine-disrupting properties.

SECTION 12: Ecological information

Toxicity

Copper alloys pose a general ecotoxicological risk to the environment.

Acute Toxicity Fish:

Copper	LC50 Fish (96 Hours) Minimum: 0.0087 mg/l Maximum: 21 mg/l Median: 0.665 mg/l
Red Phosphorous	LC50 Fish (96 Hours) Minimum: 0.002 mg/l Maximum: 0.154 mg/l Median: 0.006 mg/l
Silver	LC50 Fish (96 Hours) Minimum: 0.00213 mg/l Maximum: 58 mg/l Median: 0.00807 mg/l

Acute Toxicity Algae:

Copper	EC50 Algae (72 or 96 Hours) Testing time: 72 Hours Minimum: 0.01 mg/l Maximum: 0.91 mg/l Median: 0.57 mg/l
	EC50 Algae (72 or 96 Hours) Testing time: 96 Hours Minimum: 0.04 mg/l Maximum: 9.2 mg/l Median: 7.9 mg/l
Silver	EC50 Algae (72 or 96 Hours) Testing time: 96 Hours Minimum: 0.00163 mg/l Maximum: 0.00234 mg/l

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	Median: 0.00198 mg/l
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Acute Toxicity Crustaceans:

Copper	LC50 Crustaceans (48 Hours) Minimum: 0.000072 mg/l Maximum: 5.36 mg/l Median: 0.044 mg/l EC50 Crustaceans (48 Hours) Minimum: 0.0016 mg/l Maximum: 0.34 mg/l Median: 0.02 mg/l
Red Phosphorous	EC50 Crustaceans (48 Hours) Minimum: 0.03 mg/l Maximum: 0.25 mg/l Median: 0.14 mg/l
Silver	LC50 Crustaceans (48 Hours) Minimum: 0.0015 mg/l Maximum: 4.5 mg/l Median: 0.015 mg/l

Persistence and degradability

Not applicable for inorganic substances.

Bioaccumulative potential

Copper is an essential basic element; it is not accumulated but merely stored by some organisms for later use.

Mobility in soil

Copper alloys are practically insoluble in water.

Other adverse effects

Copper and silver are suspected of having endocrine-disrupting properties.

SECTION 13: Disposal considerations

Waste treatment methods

Waste management

During waste handling, attention must be paid to the safety instructions for handling the product. The waste product must be disposed of through a licensed operator or sent to a metal recovery facility capable of handling fine waste. Contaminated packaging must be disposed of according to local guidelines.

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Disposal methods

Dispose of waste and residues in accordance with local government regulations and in compliance with all local, national, and international regulations.

SECTION 14: Transport information


UN number

UN number	3077
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UN proper shipping name

DOT	Environmentally hazardous substance, solid, n.o.s. (copper)
ADR / RID	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper)
IATA / IMDG	Environmentally hazardous substance, solid, n.o.s. (copper)

Transport hazard class(es).

DOT	No information available.
ADR / RID	
Class	9
Danger number	90
Labels	
Classification	M7
Tunnel code	-
Limited quantity	5 kg
Exempted quantity	E1
IMDG	
Class	9
EmS	F-A, S-F
Limited quantity	5 kg
Exempted quantity	E1
Packing instructions IMDG	P002 LP02
IBC instructions	IBC08

Packaging group

DOT	No information available.
ADR / RID	III
IMDG	III

Environmental hazards

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Environmentally hazardous ingredients: copper.

Special precautions for user

For information on safe handling see section 7.

For information on personal protection see section 8.

For information on disposal see section 13.

Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable.

SECTION 15: Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory.

Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

Substance	CAS No.	Quantity
Copper	7440-50-8	≤ 99,5 %
Silver	7440-22-4	≤ 0,2 %

US State Regulations

None of the contained substances are listed on California Proposition 65 - Safe Drinking Water and Toxic Enforcement Act of 1986.

U.S. - New Jersey - Right to Know Hazardous Substance List

Substance	CAS No.	Quantity
Copper	7440-50-8	≤ 99,5 %
Silver	7440-22-4	≤ 0,2 %
Phosphorous	7723-14-0	≤ 0,2 %

All national and local legislation and regulations must be complied with.

SECTION 16: Other information

Changes to the previous version

Version 1 – creation – 12/11/2023

Version 1.1 – update – 04/30/2024.

Section 1.4 was updated.

Phrase meaning

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Aquatic Chronic 2	Hazardous to the aquatic environment — Chronic hazard category 2
Aquatic Chronic 3	Hazardous to the aquatic environment — Chronic hazard category 3
Flam. Sol. 1	Flammable solids, hazard category 1
H228	Flammable solid
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

Acronyms

CAS	Chemical Abstracts Service
CMR	Substance classified as carcinogenic, mutagenic and toxic for reproduction
DOT	Department of Transportation
LC50	Lethal Concentration 50 %
LD50	Lethal Dose 50 %
UN	United Nations

Further information

This safety data sheet provides information on the safety precautions required. All information provided in this safety data sheet is to the best of our current knowledge and cannot be taken as a general or legal reference for specific product properties.